

I claim:

1. A method of proving the existence of an alternate glucose pathway, comprises:

drawing a small sample of CSF, blood and urine;

5 testing the CSF, blood and urine samples for concentrations of glucose and for concentrations of a component of CSF having as properties, an equal ability to flow within the BBB and the CSF, is an insulin counterregulatory hormone and is not produced by the brain;

10 infusing the component of CSF into a vein;

testing the CSF, blood and urine samples for concentrations of glucose and for concentrations of the component of CSF after the infusion; and,

15 comparing the glucose concentration and the concentration of the component of CSF in the CSF before and after the infusion into the vein.

2. A method for proving the existence of an alternate glucose pathway, comprises:

20 introducing an Ommaya reservoir into the intraventricular spaces of the brain of an animal;

starting a positron emission tomography (PET) scan on the animal;

25 drawing a desired amount of cerebral spinal fluid (CSF) from the Ommaya reservoir, the desired amount of equal volume as an amount of a radiolabeled compound to be injected subsequently into the Ommaya reservoir; and,

injecting a desired amount of the radioactive compound, into the Ommaya reservoir until the PET scan detects radioactivity in the surface of the cortex in the brain and the spine.

5 3. The method of claim 2 wherein the animal is a non-human primate.

4. The method of claim 2 wherein the radiolabeled compound is 2-deoxy-2-[18F] fluoro-D-Glucose.

10 5. The method of claim 2 wherein the radiolabeled compound is diluted from a stock solution of the radiolabeled compound with a solution isotonic to CSF prior to injecting into the Ommaya reservoir.

6. The method of claim 2 wherein the radiolabeled compound is 0.03-0.05 mCi/kg of 2-deoxy-2-[18F] fluoro-D-Glucose.

15 7. The method of claim 2 further comprising withdrawing a second sample of CSF from the Ommaya reservoir;

injecting a low dose of insulin and 2-deoxy-2-[18F] fluoro-D-Glucose into the Ommaya reservoir;

observing any changes in the PET scan;

20 injecting a desired amount of cortisol and 2-deoxy-2-[18F] fluoro-D-Glucose into the Ommaya reservoir after the insulin infusion; and,

observing any changes in the PET scan.

8. The method of claim 7 wherein the dose of insulin is approximately one hundred microunit/kg.

25 9. The method of claim 7 wherein the amount of cortisol is approximately one milligram.

10. The method of claim 7 wherein the amount of 2-deoxy-2-[18F] fluoro-D-Glucose is approximately 0.03-0.05 mCi/kg.

11. A method of proving the existence of an alternate glucose pathway, comprises:

5           injecting a desired amount of a radioactive compound, into an Ommaya reservoir of an animal;

          isolating a whole brain of the animal having a cortex layer I-III; and,

          detecting presence of radioactivity on the cortex layer I-III in the brain by autoradiography.

12. The method of claim 11 wherein the amount of radioactive compound is approximately 40 uCi/kg.

13. The method of claim 11 wherein the radioactive compound is 2-deoxy-D[<sup>14</sup>C]glucose.

15           14. The method of claim 11 wherein the animal is a non-human primate.

15           15. A method for establishing a diagnostic profile for each disorder at the different age groups based on observing the effect of an artificially induced chemical imbalance in CSF, brain, spine, plasma and urine, comprises:

25           a) introducing an Ommaya reservoir into an anterior horn of a lateral ventricle of the brain, a subarachnoid catheter on the brain, a spinal catheter on the spine, intracranial pressure catheter at the CSF, a Foley catheter at a bladder, a central catheter in either a jugular or femoral vein of an animal,

          b) starting a positron emission tomography (PET) scan on the

animal;

c) drawing a desired amount of cerebral spinal fluid (CSF) from the Ommaya reservoir, and subarachnoid catheter of a normal functioning brain, a desired amount of CSF from the spinal region of a normal functioning spine;

d) drawing blood from either the jugular or femoral vein;

e) drawing urine from the bladder;

f) measuring each desired biological marker/s present in the CSF namely glucose, metabolites, neurotransmitters, neuropeptides, insulin, immune globulins, neuronal growth factors, counterregulatory hormones, thyroid hormones, other hormones found in the CSF, and peptidases on the CSF, plasma and urine drawn above for a baseline data;

g) measuring electroencephalogram activities of the brain;

h) measuring intracranial pressure at the CSF;

i) injecting a radiolabeled biological marker, into the Ommaya reservoir for a determination of a time before a first sample is taken for testing;

j) infusing five times the baseline amount as determined for each of the biological marker from step f) into the Ommaya reservoir over a 6 hour period to artificially induce a diseased state;

k) continuing the infusion at this elevated amount for each 6 hour interval for a total of one week;

l) withdrawing a CSF sample from the Ommaya reservoir and the subarachnoid and spinal catheters equivalent in amount as the

infused volume in step i) for the first sample and step j) for the subsequent samples, urine from the Foley catheter and plasma from the central catheter at the time the radiolabeled biological marker reaches the cortex and every six hours thereafter and at the completion of infusion of each biological marker;

m) determining the effect of each infusion of a biological marker from step j) to the level of all the biological markers at those time intervals;

n) graphing for each time interval taken, the levels of the different biological markers at each infusion of a biological marker from step j) for each age group; and,

o) repeating the steps a) to n) for each biological marker thereby obtaining a diagnostic profile on the effect of each biological marker infused at five times the normal level on the level of all the biological markers.

16. A diagnostic profile generated according to the method of claim 15.

17. The method of claim 15 wherein the animal is a non-human primate, the non-human primate selected for the different age group being tested.

18. The method of claim 15 wherein the radiolabeled biological marker is  $C^{11}$  labeled.

19. The method of claim 18 wherein the  $C^{11}$  labeled biological marker is approximately 0.02 mCi/kg.

20. A method of using a diagnostic profile obtained from an animal for diagnosing a human patient, comprises:

a) drawing a normal human CSF samples by a spinal tap from different age groups for determining a normal level for each biological marker at the different age groups;

5 b) drawing human CSF samples by a spinal tap from patients from different age groups with a disorder, for determining a diseased level for each biological marker at the different age groups;

c) graphing the levels of the different biological markers obtained from the normal and the diseased patients;

10 d) discarding the biological marker where the normal level of the animal is different from the normal level of the human patient;

e) comparing the graph of the normal patient and the graph of the diseased patient with the graph obtained from the animal;

15 f) choosing the graph of the animal that comes closest to the graph of the normal and diseased patient;

g) determining the biological marker in the animal that produced the same graph as the diseased human patient; and,

20 h) diagnosing a disorder of the diseased human patient based on the biological marker determined from step g).

21. The method of claim 20 wherein the animal is a non-human primate.

22. The method of claim 20 further comprising categorizing the graphs for each disorder at each state and each age groups.

25 23. A method of using CSF as a biological fluid for testing and consequently diagnosing a mental disorder and a nondetectable

neurological disorder.

24. A medication for the treatment of disorders, the medication having a property of crossing the blood brain barrier and any one of the properties selected from the group consisting of binding a biological marker present in excess in CSF to reduce the level to normal, binding a biological marker present in CSF to eliminate the level to undetectable amounts, elevating a level of a biological marker to normal and introducing an absent biological marker desired to be present in the CSF.

25. The medication of claim 23 wherein the medication is administrable orally, intramuscularly or intravenously.

26. A method of treating mental disorders and neurological disorders not detectable by CT Scan and MRI, comprising:

introducing a medication into the CSF, the medication having no ability to cross the blood brain barrier and a property selected from the group consisting of binding a biological marker present in excess in CSF to reduce the level to normal, binding a biological marker present in CSF to eliminate the level to undetectable amounts, elevating a level of a biological marker to normal and introducing an absent biological marker desired to be present in the CSF.

27. The method of claim 25 wherein the medication is introduced by injection or infusion.